# MARSHALLS ENERGY CO, INC.
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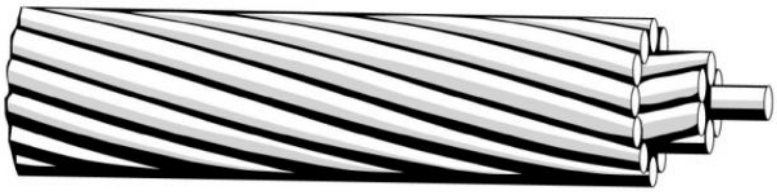
**TRANSMISSION & DISTRIBUTION SPECIFICATION**

**SPECIFICATION NO.: MEC-Dist-Cable-10**

**FOR**

# PRIMARY OVERHEAD CABLE
# 15kV



| Revision | Date | Reviewed | Approved |
|---|---|---|---|
| One | May 2019 | J Pedro | S Wakefield |
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# PRIMARY OVERHEAD WIRE
# 15kV

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**PRIMARY OVERHEAD WIRE 15kV**

## 1. SCOPE

1.1. This specification covers primary overhead conductors rated at 15,000 volts.

1.2. The cable shall be suitable for use in wet and dry locations in the overhead medium voltage distribution system of the Marshalls Energy Co, Inc.

1.3. The cable shall be operated at normal conductor temperatures not exceeding 90°C. The emergency rating shall be 130°C for periods which shall not exceed 100 hours per year. For the life of the wire, there shall be no more than five occurrences of 100-hour overload periods.

## 2. APPLICABLE PUBLICATION

2.1. The cables shall meet the requirements of NEMA Standard Publication for Wire and Cable for the Transmission and Distribution of Electrical Energy.

2.2. Except as specified herein, the cables shall meet or exceed requirements of all applicable industry conductor, insulation and cable standards and specifications, i.e., ANSI, ASTM, EEl, IPCEA, NEMA and Underwriter's Laboratory.

## 3. DEVIATIONS AND NON-CONFORMANCE REQUIREMENTS

3.1. Deviations from this specification or changes in the material or design after the purchase order has been placed must be approved by the MEC Technical department and acknowledged by a Purchase Order Amendment issued by MEC.

3.2. Units received with deviations or non-conformances that are not acknowledged per Section 3.1 are subject to rejection. The Supplier of rejected units is responsible for any corrective action including but not limited to materials, labor and transportation necessary to dispose of or make the units conform to the specification.

3.3. Notification of defective units discovered before or after installation that are believed to be inherent to manufacturing problems or workmanship shall be made

and forwarded to the Supplier. The description of the item, documentation of the problem and the described information, disposition and/or follow-up (as appropriate) that MEC expects from the Supplier will be specified. The Supplier's response shall be made within thirty (30) days unless an extension is acknowledged and approved in writing by the MEC Procurement Manager.

## 4. SUBMITTALS

4.1. Shop drawings indicating details of construction shall be submitted to MEC Procurement Manager for review and approval.

4.2. MEC shall be allowed two (2) weeks to review and approve drawings provided in Section 4.1 without affecting the shipping date. Delays in delivery due to drawings that are disapproved during this review period are the responsibility of the Supplier.

4.3. Drawings returned to the Supplier as approved shall be considered authorization to proceed with the work. The approval of MEC shall in no way abrogate the requirements of this specification.

## 5. CERTIFIED LABORATORY TEST REPORTS

Certified tests shall be conducted in accordance with applicable standards. The Supplier shall furnish two (2) copies of certified test reports for all tests to the MEC Procurement Manager within two (2) weeks of delivery along with a statement certifying that the cable meets all the requirements of the applicable standards and this specification.

## 6. DESIGN AND CONSTRUCTION

6.1. CONDUCTOR

6.1.1. The cable shall be supplied in accordance with the data shown in the attached Table A. Stranded (Classes AA and A) bare copper are suitable for overhead transmission and distribution applications. Classes B and C are NOT suitable to MEC for Overhead line work.

6.1.2. Insulated conductors shall be soft annealed copper. (Not applicable)

6.1.3. The stranding shall be concentric for Hard and Medium-Hard Drawn wires

6.1.4. The neutral conductor shall be bare, medium-hard drawn copper.

6.1.5. Conductor size shall be in accordance with Table A and shall be as specified on the Purchase Order. Standard size for MEC is 2/0-7 bare Cu Concentrically stranded class A, AA in hard drawn or medium-hard drawn temper.

## 6.2. INSULATION

6.2.1. Not applicable

6.2.2. Not applicable

6.2.3. Not applicable

6.2.4. Not applicable

6.2.5. Not applicable

## 6.3. IDENTIFICATION OF CABLE

Industry standard marking required

## 6.4. REELS

6.4.1. The inner drum end of the cable, when allowed to project through the flange of the reel shall be protected to avoid injury to the cable or cable seal.

6.4.2. Wooden reels shall have steel collars with an outer flange of at least one half inch to withstand handling. Reels with at least 72-inch flanges shall be four-ply and at least three-ply above 60 inches. The mandrel hole shall have at least two inches of uncut wood all around the hole.

6.4.3. Reels shall be designed to support the weight of the cable and withstand handling in accordance with industry practices.

6.4.4. The mandrel hole size shall be three inches, minimum.

6.4.5. A durable, non-fading label shall be securely attached to a flange of the reel. The label shall plainly indicate the following:

A. MEC Purchase Order number
B. Shipping length in feet of the cable on the reel
C. Beginning and ending sequential footage number
D. Number, type, thickness and size of conductor
E. Thickness and type of insulation (not applicable)
F. Voltage rating
G. Tare weight

6.4.6. Each reel shall be marked with an arrow and suitable stenciled wording, on the flange of the reel, indicating the direction the reel should be rolled.

## 7. QUALITY CONTROL

The Supplier shall have a quality control program to ensure compliance with the requirements of this specification. The program shall be documented and available for GPA's review if requested.

Documentation of the quality control program shall indicate where in the production and manufacturing process the quality checks are taken, describe the purpose of the checks, and describe the nature of the check, i.e. if check is visual only or if electrical or mechanical testing is used.

## 8. PACKING AND SHIPPING

8.1. Each end of each length of cable shall be durably sealed before shipment to prevent entrance of moisture. Evidence of water in the cable as received shall be cause for rejection.

8.2. The cable shall be placed on the reels in such a manner that it will be protected from injury during shipment. Care shall be taken to prevent the reeled cable from becoming loose. Each end of the cable shall be firmly and properly secured to the reel.

8.3. The reels shall be lagged or covered with suitable material to provide physical protection for the cables during transit and during ordinary handling operations and storage. MEC Engineering shall approve the materials and system used to accomplish this.

8.4. The reels shall be securely blocked in position so that they will not shift during transit.

8.5. The Supplier shall have adequate work and inspection instructions for handling, interim storage, preservation, packaging, and shipping to protect the quality of the cable and prevent damage, loss and deterioration.

## TABLE A – Bare Copper Overhead Conductor.

# Bare Copper

| Size (AWG) | Stranding | Stranding Class | Weight (lbs/1000 ft) | Diameter (mils) | | Hard Drawn | | Medium-Hard Drawn | | Soft-Drawn (Annealed) | | Allowable Ampacity+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Individual Wires | Complete Conductor | Rated Strength (lbs) | DC Resistance (ohms/1000 ft) @20°C | Rated Strength (lbs) | DC Resistance (ohms/1000 ft) @20°C | Rated Strength (lbs) | DC Resistance (ohms/1000 ft) @20°C | |
| STRANDED | | | | | | | | | | | | |
| 8 | 7 | B | 51 | 49 | 146 | 777 | .6663 | 610 | .6629 | 499 | .6408 | 95 |
| 6 | 7 | B | 81 | 61 | 184 | 1228 | .4191 | 959 | .4169 | 794 | .4030 | 130 |
| 4 | 7 | A, B | 128.9 | 77 | 232 | 1938 | .2636 | 1505 | .2622 | 1320 | .2534 | 170 |
| 3 | 7 | A, B | 162.5 | 87 | 260 | 2433 | .2090 | 1885 | .2079 | 1670 | .2010 | 200 |
| 2 | 7 | A, B | 204.9 | 97 | 292 | 3050 | .1660 | 2360 | .1650 | 2110 | .1578 | 230 |
| 1 | 7 | A | 258.4 | 109 | 328 | 3801 | .1316 | 2955 | .1309 | 2662 | .1252 | 265 |
| 1/0 | 7 | A, AA | 326.1 | 123 | 368 | 4752 | .1042 | 3705 | .1037 | 3221 | .1002 | 310 |
| 2/0 | 7 | A, AA | 410.9 | 138 | 414 | 5926 | .08267 | 4640 | .08224 | 4062 | .07949 | 355 |
| 2/0 | 19 | B | 410.9 | 84 | 418 | 6690 | .08267 | 4765 | .08224 | 4024 | .07949 | 355 |
| 3/0 | 7 | A, AA | 518.1 | 155 | 464 | 7366 | .06556 | 5812 | .06522 | 5118 | .06304 | 410 |
| 4/0 | 7 | A, AA | 653.3 | 174 | 522 | 9154 | .05199 | 7278 | .05172 | 6459 | .04999 | 480 |
| 4/0 | 19 | B | 653.3 | 106 | 528 | 9617 | .05199 | 7479 | .05172 | 6453 | .04999 | 480 |
| 250 | 19 | A | 771.9 | 115 | 574 | 11360 | .04400 | 8836 | .04378 | 7627 | .04231 | 530 |
| 250 | 37 | B | 771.9 | 82 | 575 | 11600 | .04400 | 8952 | .04378 | 7940 | .04231 | 530 |
| 300 | 19 | A | 926.2 | 126 | 628 | 13510 | .03667 | 10530 | .03648 | 9160 | .03526 | 590 |
| 350 | 19 | A | 1080.6 | 136 | 679 | 15590 | .03143 | 12200 | .03127 | 10680 | .03022 | 650 |
| 500 | 37 | A, B | 1543.8 | 116 | 814 | 22510 | .02200 | 17550 | .02189 | 15240 | .02116 | 810 |
| 600 | 37 | A, AA | 1852.5 | 127 | 891 | 27020 | .01834 | 21060 | .01825 | 18300 | .01763 | 910 |
| 750 | 61 | A, B | 2315.6 | 111 | 998 | 34090 | .01467 | 26510 | .01459 | 22890 | .01410 | 1040 |
| 1000 | 61 | A, B | 3087.5 | 128 | 1152 | 45030 | .01100 | 35100 | .01094 | 30500 | .01058 | 1240 |

+Ampacity based on 75°C conductor temperature; 25°C ambient temperature; 2 ft./sec. wind in sun.

End Of Specification.